data were obtained on coal crude petroleum and natural gas used at the producing establishment for power and heat· and on electric energy generated and used at the same mining operation For electric energy ' the figures actually collected represented total quantity generated (excluding generating-station use) and quantity of electric energy generated and sold The difference between these two quantity figures represented electric energy generated and used.

Experience based on past censuses indicates that the major portion of the information compiled on detailed fuels is reported by relatively large establishments For this reason inquiries on fuel detail were not directed to establishments reported on short forms As a result of these limitations and because of some incomplete reporting a total of $42 million was tabulated as "undistributed" fuels costs amounting to approximately 14 percent of the total fuels cost tabulated for 1963.

In order to provide total figures for energy used by industry geographic area and type of operation the energy figures were reduced to a common unit of measure representing kilowatt-hours the international unit of energy These figures include an estimated kilowatt-hour equivalent for "other fuels" for which only "cost" was reported and for the "undistributed" fuels cost The conversion factors used in computing these kilowatt-hour equivalents are as follows:

Coal......................1 ton = 7,677 kwh
Crude petroleum 1 barrel ....: 1 700 kwh
Gas......................1 MCF :; 307.7 kwh
Gasoline. . ...1 gallon : 36.4 kwh
Distillate fuel oil 1 barrel : 1 707 kwh
Residual fuel oil. 1 barrel : 1 842 kwh
Other fuels and undistributed....$1 243 kwh

[29. POWER EQUIPMENT

Totals for prime movers and electric motors are shown separately The horsepower ratings for prime movers include information for such types of power equipment as internal combustion engines steam and hydraulic turbines, and reciprocating steam engines The totals for prime movers are further separated between those used for driving electric generators and those used for other purposes The statistics for prime movers not driving generators include data for highway-type automobiles trucks and /other equipment but figures for such equipment are also shown separately For 1963 as for 1954 (the last census in which horsepower data were collected) separate figures were obtained on "loading equipment " "transportation equipment " and "all other equipment" for all industries except oil and gas extraction Under loading equipment are included such items as power shovels dragline excavators and scrapers for use underground or on the surface Transportation equipment includes locomotives tractors trucks and shaft hoists Other equipment includes drills compressors machine tools pumps and preparation plant machinery.

The aggregate horsepower figure represents the unduplicated horsepower for total equipment available for use and provides a measure of the mechanical power (available in mining establishments The figure is derived by adding together the horsepower of prime [movers and of electric motors driven by purchased electric energy To secure the latter figure the total horsepower for electric motors was distributed by establishment into two categories: Motors driven by purchased electric energy and motors driven by energy generated at the establishment For establishments which both generate and purchase electrictiy the total horsepower for electric motors was prorated on the basis of the ratio of the net quantity purchased to the net total for electric energy used.

As in past censuses respondents were requested to report horsepower of standby equipment as well as equipment in operation at the end of the year including all prime movers and motors in both mobile and stationary equipment.

30. RELATION OF LABOR COSTS TO OUTPUT

Three analytical tables are included in the report to relate labor requirements to output measures:

(1) Table 8 of the industry chapters shows general statistics for establishments classified by output per man-hour, with output generally measured in physical units (such as tons of coal) of shipments of the primary products of the industry.

Where feasible the distribution by output per man-hour is shown separately for major types of operation since it differs significantly for open pits as compared with underground mine's, and for a mine only a mine and plant, and a plant only. Meaningful ratios of output per man-hour could not be computed when a significant portion of the production resulted from the work of proprietors or contractors for whom man-hours figures are excluded, or where a significant portion of the man-hours of workers was spent in development or exploration work Such operations were included as "unclassified."

(2) Table 9 of the industry chapters shows general statistics for establishments classifed by the ratio of payroll of all employees to value added in mining This distribution was shown by geographic divisions insofar as feasible.

(3) Table 10 of the industry chapters shows a frequency distribution of establishments by classes of value added in mining per employee by employment size of establishment.

In comparing labor costs with value added in tables 9 and 10 it should be noted that value added as here computed includes many expenses for which no separate data were obtained in the 1963 minerals census such as taxes royalties interest paid and nonpayroll benefits to employees.

One of the most striking developments in the mineral industries in recent years has been the rapid decline in labor requirements associated with